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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/451,080	11/30/1999	SHIGETO OHMORI	024060-114	8572

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EXAMINER

SPECTOR, DAVID N

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 09/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/451,080		OHMORI ET AL.	
	Examiner		Art Unit	
	David N. Spector		2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2006 and 31 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-10 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 4-5 and 11-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Status/Background Information

- A Notice of Allowance and Issue Fee Due and a Notice of Allowability were mailed on March 26, 2001 in application no. 09/451,080. The issue fee was timely received in the Office on June 26, 2001.
- On October 4, 2001, the Director of Technology Center 2800 withdrew the application from issue under the provisions of 37 CFR 1.313 to reopen prosecution "due to the unpatentability of one or more claims."
- Subsequent to the mailing of the October 4, 2001 notice withdrawing the application from issue, a patent number of 6,301,062 and an issue date of October 9, 2001 were assigned as a result of the payment of the issue fee on June 26, 2001.
- On March 11, 2002 the present petition was filed by the applicants requesting that the Office initiate a "Commissioner ordered reexamination".
- On August 16, 2006 the Office of Petitions issued a notice vacating the patent grant that was mailed to applicants, stating that the above-identified application was mistakenly indicated to have been granted as U.S. Patent No. 6,301,062 on October 9, 2001.
- On August 31, 2006 the petition to initiate a Commissioner ordered reexamination was dismissed.
- Prosecution of this application is presently open, with claims 1-15 pending therein.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishii (U.S. Patent No. 6,157,488).

IN REGARD TO CLAIM 1 Ishii discloses an optical system **60** (col. 13, ln. 9-20; **FIG. 22**), comprising a including a cemented lens element **41** (col. 14, ln. 65-col. 15, ln. 47; **FIG. 12**, **FIG. 22**) formed by cementing two constituent lens elements **101**, **103** made of different optical materials together (col. 13, ln. 37-42; col. 15, ln. 32-34), the cemented lens element **41** having a diffractive optical surface **102** formed at a cemented interface **201/202** between the two constituent lens elements **101**, **103** the two constituent lens elements **101**, **103** having at their respective interfaces **303**, **304** with air a radius of curvature (col. 26, ln.59-62) which is different from the radius of curvature that they have at the cemented interface **201/202** (*e.g. the "radius of curvature" at the cemented interface 201/202 is taken to be the over-all/underlying curvature of the interface 201/202 between the surfaces 201, 202.* In **FIG. 12**, for example, the interface **201/202** is a planar surface defined by the aligned "peaks" of the relief patterns disposed in/on surfaces **201**, **202**). Independent claim 1 is therefore anticipated by Ishii.

IN REGARD TO CLAIM 2 Ishii discloses an optical system according to independent claim 1 from which claim 2 depends; wherein one of the two constituent lens elements of the cemented lens element has a refractive optical power of an opposite sign to the diffractive optical power of the cemented interface (col. 15, ln. 38-41). Claim 2 is therefore anticipated by Ishii.

IN REGARD TO CLAIM 3 Ishii discloses an optical system according to independent claim 1 from which claim 3 depends; wherein the two constituent lens elements of the cemented lens element have different refractive optical power (col. 15, ln. 28-33; **FIG. 12**). Claim 3 is therefore anticipated by Ishii.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii (US-6157488-A) in view of Takayama et al. (U.S. Patent No. 6,081,389).

IN REGARD TO CLAIM 6 Ishii discloses an optical system according to independent claim 1 from which claim 6 depends. Ishii does not expressly disclose that the aforesaid optical system is a zoom lens system.

On the other hand, Ishii does disclose that the aforesaid cemented lens element as an improved alternative to prior art diffractive lens elements, which can be advantageously used in, *inter alia*, an image pickup apparatus such as a camera (col. 14, ln. 31-55; **FIG. 10**). Ishii is actually silent on whether lens system **60** is part a fixed focal length image pickup apparatus, or part of a zoom lens image pickup apparatus; which can be reasonably interpreted as broadly suggesting that it does not matter whether lens system **60** has a fixed focal length lens, or a zoom lens system. The use of either of the aforesaid lens systems was notoriously well-known and both were generally provided interchangeably in typical image pickup apparatus (*e.g. cameras*) at the time of the instant invention.

From the aforesaid considerations, it would have been clear to one of ordinary skill in the art at the time of the instant invention, that the cemented lens element of independent claim 1 could be advantageously used in at least the same types of image pickup apparatus/systems in which a prior art diffractive lens element is generally employed. For example, in the same area of art as the instant invention, Takayama et al. discloses zoom lens systems (**FIG. 2** ref. **r2, r6**; cf: **FIG. 3, 4, 63, 66, 69**) included in an image pickup apparatus for a camera comprising at least one prior art diffractive optical element (col. 6, ln. 29-32); in which a diffractive relief surface is formed at/on the surface of a single refractive optical element (col. 9, ln. 35-44; **FIG. 16**).

Clearly then, it would also have been obvious to one of ordinary skill in the art at the time of invention to use the instant cemented lens elements in a zoom lens system of the type disclosed in Takayama et al. Claim 6 is therefore unpatentable over Ishii in view of Takayama et al.

IN REGARD TO CLAIM 7 Ishii discloses an optical system according to independent claim 1 from which claim 7 depends. Ishii does not expressly disclose that the aforesaid optical system is a zoom lens system having a plurality of lens units, at least two of the lens units each including a cemented lens element as recited in independent claim 1.

On the other hand, Ishii does disclose that the aforesaid cemented lens element as an improved alternative to prior art diffractive lens elements, which can be advantageously used in, *inter alia*, an image pickup apparatus such as a camera (col. 14, ln. 31-55; **FIG. 10**). Ishii is actually silent on whether lens system **60** is part a fixed focal length image pickup apparatus, or part of a zoom lens image pickup apparatus; which can be reasonably interpreted as broadly suggesting that it does not matter whether lens system **60** has a fixed focal length lens, or a zoom lens system. The use of either of the aforesaid lens systems was notoriously well-known and both were generally provided interchangeably in typical image pickup apparatus (*e.g. cameras*) at the time of the instant invention.

From the aforesaid considerations, it would have been clear to one of ordinary skill in the art at the time of the instant invention, that the cemented lens element of independent claim 1 could be advantageously used in at least the same types of image pickup apparatus/systems in which a prior art diffractive lens element is generally employed. For example, in the same area of art as the instant invention, Takayama et al. discloses a zoom lens system (**FIG. 2**) having a plurality of lens units **I, II, III** included in an image pickup apparatus for a camera, two of the lens (e.g. **I** and **II**) units each comprising at least one prior art diffractive optical element (col. 6, ln. 29-32); in which a diffractive relief surface is formed at/on the surface of a single refractive optical element (col. 9, ln. 35-44; **FIG. 16**). Clearly then, it would also have been obvious to one of ordinary skill in the art at the time of invention to use the instant cemented lens elements in a zoom lens system having a plurality of lens units, at least two of the lens units each including a cemented lens element as recited in independent claim 1, from which claim 7 depends. Claim 7 is therefore unpatentable over Ishii in view of Takayama et al.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii (U.S. Patent No. 6,157,488) in view of Konno et al. (U.S. Patent No. 6,157,781).

IN REGARD TO CLAIM 8 Ishii discloses an optical system **60** (col. 13, ln. 9-20; **FIG. 22**), comprising a including a cemented lens element **41** (col. 14, ln. 65-col. 15, ln. 47; **FIG. 12**, **FIG. 22**) formed by cementing two constituent lens elements **101**, **103** made of different optical materials together (col. 13, ln. 37-42; col. 15, ln. 32-34), the cemented lens element **41** having a diffractive optical surface **102** formed at a cemented interface **201/202** between the two constituent lens elements **101**, **103** the two constituent lens elements **101**, **103** having at their respective interfaces **303**, **304** with air a radius of curvature (col. 26, ln.59-62) which is different from the radius of curvature that they have at the cemented interface **201/202** (e.g. *the "radius of curvature" at the cemented interface 201/202 is taken to be the over-all/underlying curvature of the interface 201/202 between the surfaces 201, 202.* In **FIG. 12**, for example, the interface **201/202** is a planar surface defined by the aligned "peaks" of the relief patterns disposed in/on surfaces **201**, **202**); and an image sensing surface of a solid state image sensor **61**. Ishii does not expressly disclose a low pass filter located between the fixed focal length lens system **60** and the image sensor **61**.

At the time of invention, however, using a low pass filter located between a image pickup optical system and the sensor in an solid-state imaging system would have been very well known to one of ordinary skill in the art as a means to control undesirable phenomena such as Moiré fringes caused by the relation between the number of pixels of the solid-state image sensor and the spatial frequency of an object. In particular, Konno et al. discloses the use of, and the motivation for using the aforesaid arrangement (col. 1, ln. 15-60; **FIG. 1-3**) in a solid-state image-sensor camera using a CCD image sensor. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include a low-pass filter located between the fixed focal length lens system **60** and the image sensor **61** in the fixed focal length apparatus of Ishii. Independent claim 8 is therefore unpatentable over Ishii in view of Konno et al.

IN REGARD TO CLAIM 9 Ishii, in view of Konno et al. discloses an optical system according to independent claim 8 from which claim 9 depends. Ishii further discloses one of the two constituent lens elements of the cemented lens element has a refractive optical power of an oppo-

site sign to the diffractive optical power of the cemented interface (col. 15, ln. 38-41). Claim 9 is therefore anticipated by Ishii, in view of Konno et al.

IN REGARD TO CLAIM 10 Ishii, in view of Konno et al. discloses an optical system according to independent claim 8 from which claim 10 depends. Ishii further discloses the two constituent lens elements of the cemented lens element have different refractive optical power (col. 15, ln. 28-33; **FIG. 12**). Claim 10 is therefore anticipated by Ishii, in view of Konno et al.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii (U.S. Patent No. 6,157,488) in view of Konno et al. (U.S. Patent No. 6,157,781) as applied to claim 8-10 above, and further in view of Takayama et al. (U.S. Patent No. 6,081,389).

IN REGARD TO CLAIM 13 Ishii, in view of Konno et al. discloses an optical system according to independent claim 8 from which claim 13 depends. Ishii in view of Konno et al. does not expressly disclose that the aforesaid optical system is a zoom lens system, however.

On the other hand, Ishii does disclose that the aforesaid cemented lens element as an improved alternative to prior art diffractive lens elements, which can be advantageously used in, *inter alia*, an image pickup apparatus such as a camera (col. 14, ln. 31-55; **FIG. 10**). Ishii is actually silent on whether lens system **60** is part a fixed focal length image pickup apparatus, or part of a zoom lens image pickup apparatus; which can be reasonably interpreted as broadly suggesting that it does not matter whether lens system **60** has a fixed focal length lens, or a zoom lens system. The use of either of the aforesaid lens systems was notoriously well-known and both were generally provided interchangeably in typical image pickup apparatus (*e.g. cameras*) at the time of the instant invention.

From the aforesaid considerations, it would have been clear to one of ordinary skill in the art at the time of the instant invention, that the instant cemented lens element could be advantageously used in at least the same types of image pickup apparatus/systems in which a prior art diffractive lens element is generally employed. For example, in the same area of art as the instant invention, Takayama et al. discloses zoom lens systems (**FIG. 2** ref. **r2, r6**; cf: **FIG. 3, 4, 63, 66, 69**) included in an image pickup apparatus for a camera comprising at least one prior art diffractive optical element (col. 6, ln. 29-32); in which a diffractive relief surface is formed

at/on the surface of a single refractive optical element (col. 9, ln. 35-44; **FIG. 16**). Clearly then, it would also have been obvious to one of ordinary skill in the art at the time of invention to use the instant cemented lens elements in a zoom lens system of the type disclosed in Takayama et al. Claim 13 is therefore unpatentable over Ishii, in view of Konno et al. as applied to claims 8-10 above, and further in view of Takayama et al.

IN REGARD TO CLAIM 14 Ishii, in view of Konno et al. discloses an optical system according to independent claim 8 from which claim 14 depends. Ishii, in view of Konno et al. does not expressly disclose that the aforesaid optical system is a zoom lens system having a plurality of lens units, at least two of the lens units each including a cemented lens element as recited in independent claim 1.

On the other hand, Ishii does disclose that the aforesaid cemented lens element as an improved alternative to prior art diffractive lens elements, which can be advantageously used in, *inter alia*, an image pickup apparatus such as a camera (col. 14, ln. 31-55; **FIG. 10**). Ishii is actually silent on whether lens system **60** is part a fixed focal length image pickup apparatus, or part of a zoom lens image pickup apparatus; which can be reasonably interpreted as broadly suggesting that it does not matter whether lens system **60** has a fixed focal length lens, or a zoom lens system. The use of either of the aforesaid lens systems was notoriously well-known and both were generally provided interchangeably in typical image pickup apparatus (*e.g. cameras*) at the time of the instant invention.

From the aforesaid considerations, it would have been clear to one of ordinary skill in the art at the time of the instant invention, that the instant cemented lens element could be advantageously used in at least the same types of image pickup apparatus/systems in which a prior art diffractive lens element is generally employed.

For example, in the same area of art as the instant invention, Takayama et al. discloses a zoom lens system (**FIG. 2**) having a plurality of lens units **I**, **II**, **III** included in an image pickup apparatus for a camera, two of the lens (e.g. **I** and **II**) units each comprising at least one prior art diffractive optical element (col. 6, ln. 29-32); in which a diffractive relief surface is formed at/on the surface of a single refractive optical element (col. 9, ln. 35-44; **FIG. 16**). Clearly then, it would also have been obvious to one of ordinary skill in the art at the time of invention to use the instant cemented lens elements in a zoom lens system having a plurality of lens units, at

least two of the lens units each including a cemented lens element as recited in independent claim 8, from which claim 14 depends. Claim 14 is therefore unpatentable over Ishii, in view of Konno et al. as applied to claims 8-10 above, and further in view of Takayama et al.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii (U.S. Patent No. 6,157,488) in view of Ogawa (U.S. Patent No. 5,930,043).

Ishii discloses a method for correcting aberration, comprising steps of disposing a cemented lens element **41** in the optical system **60** (col. 13, ln. 9-20; **FIG. 22**) ; wherein the cemented lens element is formed by cementing at least two constituent lens elements made of different optical materials together, with a diffractive optical surface formed at a cementing interface between the two constituent lens elements, the two constituent lens elements having at their respective interfaces with air a radius of curvature different from a radius of curvature that they have at the cementing interface formed by cementing two constituent lens elements **101**, **103** made of different optical materials together (col. 13, ln. 37-42; col. 15, ln. 32-34), the cemented lens element **41** having a diffractive optical surface **102** formed at a cemented interface **201/202** between the two constituent lens elements **101**, **103** the two constituent lens elements **101**, **103** having at their respective interfaces **303**, **304** with air a radius of curvature (col. 26, ln.59-62) which is different from the radius of curvature that they have at the cemented interface **201/202** (*e.g. the "radius of curvature" at the cemented interface **201/202** is taken to be the overall/underlying curvature of the interface **201/202** between the surfaces **201**, **202**. In **FIG. 12**, for example, the interface **201/202** is a planar surface defined by the aligned "peaks" of the relief patterns disposed in/on surfaces **201**, **202**).*

Ishii does not expressly disclose that the method includes a step for optimizing correction of all aberrations occurring over the entire optical system. An earlier patent to Ogawa, however teaches the efficacy of combining refractive optical materials with a diffractive optical surface (col. 1, ln. 29-43; col. 2, ln. 19-22; **FIG 7A-8J**) as a means for optimizing correction of all aberrations occurring over the entire optical system.

Therefore, it would have been known to one of ordinary skill in the art at the time of invention that a step for combining refractive optical materials with a diffractive optical surface; could be usefully combined with a step for "optimizing correction of all aberrations occurring over the

entire optical system" in a method for correcting aberration in accordance with the instant claim 15. Independent claim 15 is therefore over Ishii, in view of Ogawa

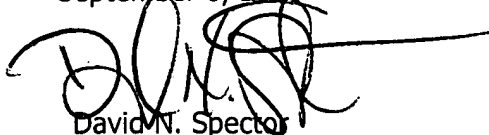
Allowable Subject Matter

Claims 4-5 and 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of the reasons for the indication of allowable subject matter: claims 4-5 and 13-14, if rewritten in independent form including all of the limitations of the base claim and any intervening claims would be allowable because of the conditional relationships recited in the third line of each of the aforesaid claims.

Other Remarks/Information

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any other inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Spector whose telephone number is (571) 272-2338. The examiner can normally be reached at this number Monday through Friday between 6:00 AM and 2:30 PM. The Official FAX number for the United States Patent and Trademark Office is (571) 273-8300.

September 8, 2006


David N. Spector
Primary Examiner
Art Unit 2873